BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Application of Wisconsin Public Service Corporation for Authority to Adjust Electric and Natural Gas Rates	Docket 6690-UR-127

SURREBUTTAL TESTIMONY OF STEVE KIHM ON BEHALF OF CITIZENS UTILITY BOARD

Q. Please state your name, business address, and occupation.

A. My name is Steve Kihm. My business address is the Citizens Utility Board (CUB), 625 North Segoe Rd, Suite 101, Madison, Wisconsin 53705. I am employed by CUB as Regulatory Strategist.

Q. Have you previously filed testimony in this proceeding?

A. Yes. I filed direct and rebuttal testimony.

Q. What is the purpose of this testimony?

A. I have some comments on the testimony of Applicant's witness Ann E. Bulkley.

Q. What is your first point?

A, Ms. Bulkley and I agree on some points. One of which is the Commission should use current information when estimating costs of equity. See Rebuttal-WPSC-Bulkley-17, 12-15.

Q. Do you have any comments on this testimony?

A. To assume that costs of equity will increase due to publicly available information, especially that related to a body so widely followed, would double count that information. Investors already know it. That is the value of finance models in efficient market situations. No individual or group of individuals can consistently outperform another in terms of estimating

future values for bond and stock prices.[1] That includes Ms. Bulkley and the experts she relies upon.

Q. Does Ms. Bulkley use current information?

A. No. She looks backward and forward, using averages of historical stock prices in her discounted cash flow model and forecasts of future interest rates in her capital asset pricing model, neither of which reflect current market conditions. Using historical averages of market prices or forecasts of those variables has been shown to be clearly inferior to using the current data.

When I was on the Commission staff in the 1990s the practice of some of my predecessors had been to average utility stock prices and dividend yields for up to a year under the mistaken notion that this would lead to more accurate cost of equity model estimates. In fact, as shown by a study of mine that was published in *Public Utilities Fortnightly*, averaging makes estimates less accurate and errors surrounding them more volatile.

I examined 475 months of data on dividend yields and interest rates. Finance principles suggest that the spot estimate will be the most accurate estimate of future dividend yield and interest rates and will have the least volatile errors, which is exactly what we observe. The current spot point estimates are comprehensive information sources, containing every piece of information knowable to the market, including anything that happened in the past and anything likely to happen in the future.

[1] Burton Malkiel, 2011, *A Random Walk Down Wall Street*, New York: W. W. Norton & Co.

Table 1
Evaluation of Dividend Yield Estimation Methods

Dividend Yield Forecast Evaluation
(Numbers in Parentheses Indicate Actual Score)

Accuracy Evaluation	Best Method	Second-Best Method	Third-Best Method	Worst Method
Minimize Average Absolute Error	SPOT (0.50%)	3-MONTH (0.54%)	6-MONTH (0.60%)	12-MONTH (0.70%)
Minimize Average Absolute Percentage Error	SPOT (6.88%)	3-MONTH (7.39%)	6-MONTH (8.17%)	12-MONTH (9.42%)
Minimize Mean Squared Error	SPOT (0.0047%)	3-MONTH (0.0053%)	6-MONTH (0.0064%)	12-MONTH (0.0088%)
Maximize Coefficient of Determination	SPOT (95%)	3-MONTH (94%)	6-MONTH (93%)	12-MONTH (90%)
Volatility Analysis	**Best Method**	**Second-Best Method**	**Third-Best Method**	**Worst Method**
Minimize Standard Deviation	SPOT (0.68%)	3-MONTH (0.73%)	6-MONTH (0.80%)	12-MONTH (0.94%)
Minimize Coefficient of Variation	SPOT (9.8)	3-MONTH (10.4)	6-MONTH (11.4)	12-MONTH (13.4)

Table 2
Evaluation of Interest Rate Estimation Methods

Bond Yield Forecast Evaluation
(Numbers in Parentheses Indicate Actual Score)

Accuracy Evaluation	Best Method	Second-Best Method	Third-Best Method	Worst Method
Minimize Average Absolute Error	SPOT (0.48%)	3-MONTH (0.53%)	6-MONTH (0.61%)	12-MONTH (0.73%)
Minimize Average Absolute Percentage Error	SPOT (5.51%)	3-MONTH (6.05%)	6-MONTH (6.86%)	12-MONTH (8.29%)
Minimize Mean Squared Error	SPOT (0.005%)	3-MONTH (0.006%)	6-MONTH (0.007%)	12-MONTH (0.010%)
Maximize Coefficient of Determination	SPOT (96%)	3-MONTH (95%)	6-MONTH (94%)	12-MONTH (91%)
Volatility Analysis	**Best Method**	**Second-Best Method**	**Third-Best Method**	**Worst Method**
Minimize Standard Deviation	SPOT (0.69%)	3-MONTH (0.75%)	6-MONTH (0.84%)	12-MONTH (1.01%)
Minimize Coefficient of Variation	SPOT (8.6)	3-MONTH (9.3)	6-MONTH (10.4)	12-MONTH (12.5)

Q. Did you update your financial analysis based on current information?

A. Yes. My updated DCF analysis is shown below.

FIGURE 3
Upated Price-to-Book

July 15, 2022				September 26, 2022			
COMPANY	STOCK PRICE	BOOK VALUE	PRICE TO BOOK	COMPANY	STOCK PRICE	BOOK VALUE	PRICE TO BOOK
ALLETE	$58.85	$45.36	1.30	ALLETE	$52.99	$45.36	1.17
Alliant Energy	$58.16	$23.91	2.43	Alliant Energy	$56.84	$23.91	2.38
Ameren Corp	$87.75	$37.64	2.33	Ameren Corp	$85.11	$37.64	2.26
American Electric Power	$95.22	$44.49	2.14	American Electric Power	$92.86	$44.49	2.09
Avista Corp	$42.19	$30.14	1.40	Avista Corp	$38.95	$30.14	1.29
Black Hills Corporation	$72.38	$43.05	1.68	Black Hills Corporation	$69.48	$43.05	1.61
CMS Energy	$66.20	$22.11	2.99	CMS Energy	$61.75	$22.11	2.79
Duke Energy	$107.43	$61.55	1.75	Duke Energy	$98.32	$61.55	1.60
Edison International	$61.56	$36.57	1.68	Edison International	$61.37	$36.57	1.68
Entergy Corp	$110.12	$57.42	1.92	Entergy Corp	$105.80	$57.42	1.84
Eversource Energy	$83.66	$42.39	1.97	Eversource Energy	$82.49	$42.39	1.95
Evergy Inc	$65.04	$40.32	1.61	Evergy Inc	$62.93	$40.32	1.56
IDACORP Inc	$105.34	$52.82	1.99	IDACORP Inc	$103.24	$52.82	1.95
NextEra Energy	$78.71	$18.95	4.15	NextEra Energy	$81.08	$18.95	4.28
NorthWestern Corp	$57.29	$43.28	1.32	NorthWestern Corp	$49.94	$43.28	1.15
Otter Tail Corp	$66.94	$23.84	2.81	Otter Tail Corp	$63.38	$23.84	2.66
Portland General	$49.49	$30.28	1.63	Portland General	$46.79	$30.28	1.55
Southern Co	$72.33	$26.30	2.75	Southern Co	$71.72	$26.30	2.73
Xcel Energy	$69.96	$28.70	2.44	Xcel Energy	$68.37	$28.70	2.38
Atmos Energy	$111.90	$59.71	1.87	Atmos Energy	$107.57	$59.71	1.80
New Jersey Resources	$44.06	$17.18	2.56	New Jersey Resources	$41.11	$17.18	2.39
NiSource	$28.78	$13.33	2.16	NiSource	$26.86	$13.33	2.02
Northwest Natural Gas	$54.05	$30.40	1.78	Northwest Natural Gas	$45.58	$30.40	1.50
ONE Gas	$98.37	$43.81	2.25	ONE Gas	$50.98	$43.81	1.16
South Jersey Industries	$33.95	$16.95	2.00	South Jersey Industries	$33.08	$16.95	1.95
Spire Inc	$70.71	$46.74	1.51	Spire Inc	$64.91	$46.74	1.39
	MEDIAN = 1.98				MEDIAN = 1.89		

The associated DCF calculations, using both the GDP growth rate (4.2%), which is too high for utilities, and a more sustainable long-run growth rate (3.2%), are:

July 15, 2022	**September 26, 2022**
$\left[\frac{1}{1.98}\right] 9.1\% + \left[1 - \frac{1}{1.98}\right] 4.2\% = 6.7\%$	$\left[\frac{1}{1.89}\right] 9.1\% + \left[1 - \frac{1}{1.89}\right] 4.2\% = 6.8\%$
$\left[\frac{1}{1.98}\right] 9.1\% + \left[1 - \frac{1}{1.98}\right] 3.2\% = 6.2\%$	$\left[\frac{1}{1.89}\right] 9.1\% + \left[1 - \frac{1}{1.89}\right] 3.2\% = 6.3\%$

The change in current stock prices has increased the cost of equity by about 10 basis points according to the DCF model. The change has been more noticeable in the CAPM analysis.

July 15, 2022	**September 26, 2022**
$2.9\% + 0.75(8.6\% - 2.9\%) = 7.2\%$	$3.9\% + 0.75(8.6\% - 3.9\%) = 7.4\%$

This suggests the utility cost of equity has risen 20 basis points. But this likely understates the change because the expected return on the S&P 500 has likely increased as well. In my

direct testimony I relied on several sources for the market return estimate, some of which have changed and some of which have not.

Broad Market Cost of Equity Estimates From Various Experts

Entity	Direct Testimony S&P 500 Cost of Equity Estimate	Surrebuttal Testimony S&P 500 Cost of Equity Estimate
McKinsey & Co	9.2%	9.2%[2]
Kroll	9.0%	9.5%[3]
Morningstar	9.0%	9.0%[4]
Damodaran (NYU)	8.6%	9.1%[5]
CUB (Kihm)	8.3%	8.4%[6]
Wells Fargo	8.3%	8.3%[7]
BlackRock	7.5%	7.8%[8]
MEDIAN	**8.6%**	**9.1%**

Based on the revised cost of equity estimates for the S&P 500, the CAPM-based utility cost of equity estimate is:

Kihm Surrebuttal Testimony

$$k = 3.9\% + 0.75(9.1\% - 3.9\%) = 7.8\%$$

[2] The analysis was completed on September 26, 2022. At that time the yield on the 30-year U.S. conventional Treasury bond was 3.10% and the yield on the inflation-adjusted 30-year Treasury bond was 0.86%, yielding a net difference of 2.2%, which is an estimate of the market's long-run inflation expectation. The cost of equity for the S&P 500 is then 2.2% + 7.0% = 9.2%.

[3] The yield on the 20-year bond in Kroll's July report was 3.5%; it is now 4.0%. The risk premium is still 5.5%.

[4] Andrew Bischof, September 27, 2022, *WEC Energy Group: Rising U.S. Electricity Demand Growth Outlook, Reaffirming Utilities Fair Value Estimates*, Chicago, IL: Morningstar.

[5] Damodaran estimates the equity risk premium relative to the 10-year U.S. Treasury bond based on five different approaches for July 2022: (1) trailing 12-month adjusted payout, ERP = 5.10%; (2) trailing 12-month cash yield, ERP = 5.45%, (3) average cash flow yield last 10 years, ERP = 5.35%; (4) net cash yield, ERP = 5.18%; and (5) normalized earnings and payout, ERP = 3.87%. The median ERP is then 5.18%. The yield on the 10-year Treasury note on September 26, 2022 was 3.88%. The cost of equity for the S&P 500 is then: 3.88% + 5.18% = 9.06%. Source: https://[pages.stern.nyu.edu]/~adamodar/.

[6] Based on macro model: cost of equity (market) = dividends / (stock price) + (stock repurchases) / (stock price) + real GDP growth + inflation rate. Updated as of September 26, 2022: 1.8%+2.4%+2.0%+2.2%=8.4%.

[7] Wells Fargo reports expected market returns for the next 10 to 15 years. It builds its expected long-term return on equity using the inflation rate, a cash discount, the equity risk premium, the dividend yield, and qualitative adjustments. Wells Fargo Investment Institute, 2022, *2022 Capital Market Assumptions: The Building Block Approach*.

[8] BlackRock reports its estimate directly and labels it "U.S. equities." This is the 30-year projection. https://[www.blackrock.com]/institutions/en-axj/insights/capital-market-assumptions_AXJ. Their method is based on Yan Li, David T. Ng, Bhaskaran Swaminathan, 2013, Predicting market returns using aggregate implied cost of capital, *Journal of Financial Economics*, 110, 419-436.

So incorporating the current information suggests that utility costs of equity now range from 6.3% to 7.8%, still at least 220 basis points lower than Applicant's current ROE.

Q. At Rebuttal-WPSC-Bulkley-48:15-17 she states, "Therefore under current market conditions, it is more reasonable to expect that the cost of equity is increasing, not decreasing as Dr. Kihm suggests." Is that a correct interpretation of your testimony?

A. No. Ms. Bulkley continues to incorrectly view the ROE as the cost of equity. Neither finance principles nor this Commission suggest that is accurate. It is unclear how she would reach that conclusion based on my direct testimony as I present only then-current cost of equity estimates. And as this testimony shows, relative to my direct testimony, my analysis indicates that the cost of equity has risen. For many years, the utility cost of equity has been in the 6% area, as that is the ROE that would drive utility stock prices to book value and eliminate any incentives for them to invest. Per my analysis, it now could be in the upper 7% area, which is higher than that seen for many years in the utility industry. But we cannot conclude that the cost of equity is rising as we look forward because the current estimate is the most accurate estimate going forward.

Q. At Rebuttal-WPSC-Bulkley-53:16, she states that the Blue Chip forecasts "may be the best known organization for consensus macro forecasts." Do you have any comments on this testimony?

A. Yes. This is the sort of information that misleads regulators. Again, appeal to common practice offers no evidence of the reasonableness of the information, as per basic critical thinking principles.[9] We know that no economic service, regardless of its popularity, can beat the market in terms of interest rate forecast accuracy. In fact, such services cannot even

[9] Tom Chatfield, 2022, *Critical Thinking*, London: Sage Publications.

get the direction of interest rates correct. If we give the professionals the benefit of the doubt, simply asking them which direction interest rates will head, they can't even tell us that.

> The *Blue Chip* forecasts of long-term interest rates fail to be superior to the random walk. Such evidence is in line with the efficient market hypothesis... we conclude that these [the *Blue Chip*] forecasts are all directionally inaccurate.[10]

Put another way, the *Blue Chip* forecasts are just as bad as all the other economic forecasts, that is, terribly inaccurate.

Q. At Rebuttal-WPSC-Bulkley-15:16-23, she states that investors expect utility stock prices to decline over the near term. Is this a forecast that Ms. Bulkley has made before?

A. Yes. With the help of my research assistant Bhairvi Manglani, I searched for prior cases in which Ms. Bulkley testified on utility rate of return. I found 11 cases over the period from 2014 to 2020. In all cases Ms. Bulkley suggested that utility stocks were overvalued and would soon be revalued to lower levels in the future.

Q. And how accurate were her forecasts?

A. As shown in Ex.-CUB-Kihm-3, in only 2 of the 11 cases did utility stocks decline in value over the succeeding 12 months, and in 9 they increased. The median stock price increase in all 11 cases was 5.3%. Of the 9 cases that are more than two years old, none had utility stock prices lower 24 months later than they were at the time she testified as to overvaluation. The median 24-month increase was 15.9%. So over a one-year period Ms. Bulkley was correct 18% of the time and incorrect 82% of the time. Over a two-year period she was incorrect

[10] Hamid Bhagenstani, Mohammad Arzaghi & Ilker Kaya, (2015) On the accuracy of Blue Chip forecasts of interest rates and country risk premiums, *Applied Economics*, 47:2, 118.

100% of the time. On an overall basis, Ms. Bulkley's directional utility stock price forecasts were correct 10% of the time and incorrect 90% of the time. Yet case after case she continues to make this claim. If she had just been guessing randomly she would have been expected to be correct 50% of the time.

Q. At Rebuttal-WPSC-Bulkley-49 she suggests FERC has found her CAPM approach to be just and reasonable. Do you have any comments on this?

A. Her statement is true, but she fails to recognize that FERC relied on an assumption that everyone, including the FERC, knows is incorrect.

Q. What is that assumption?

A. This relates to the growth rates used to determine the expected return on the S&P 500. A one-stage model relies on stock analysts growth rates; a two-stage approach typically uses the analyst growth rates in the near-term (next 5 years) and then reverts to the GDP growth rate for the long-term. Stock analyst growth rates are known to be overoptimistic, typically about three times as large as the GDP growth rate when looking at stocks in general. In this proceeding Ms. Bulkley uses a long-term growth rate of about 12% even though the GDP growth rate is 4%. We do not have to look any further to see that that is fundamentally incorrect. No one would believe that S&P 500 firms can grow at three times the rate of the economy forever. It is absurd to make such an assertion as it is physically impossible.

Q. How does the FERC justify the use of this model?

A. It does so by ignoring the uncontroverted evidence that has been presented to it. In Docket No. ER16-2320-002 FERC decided to just use the one-stage model, which uses only the high growth rates from stock analysts.

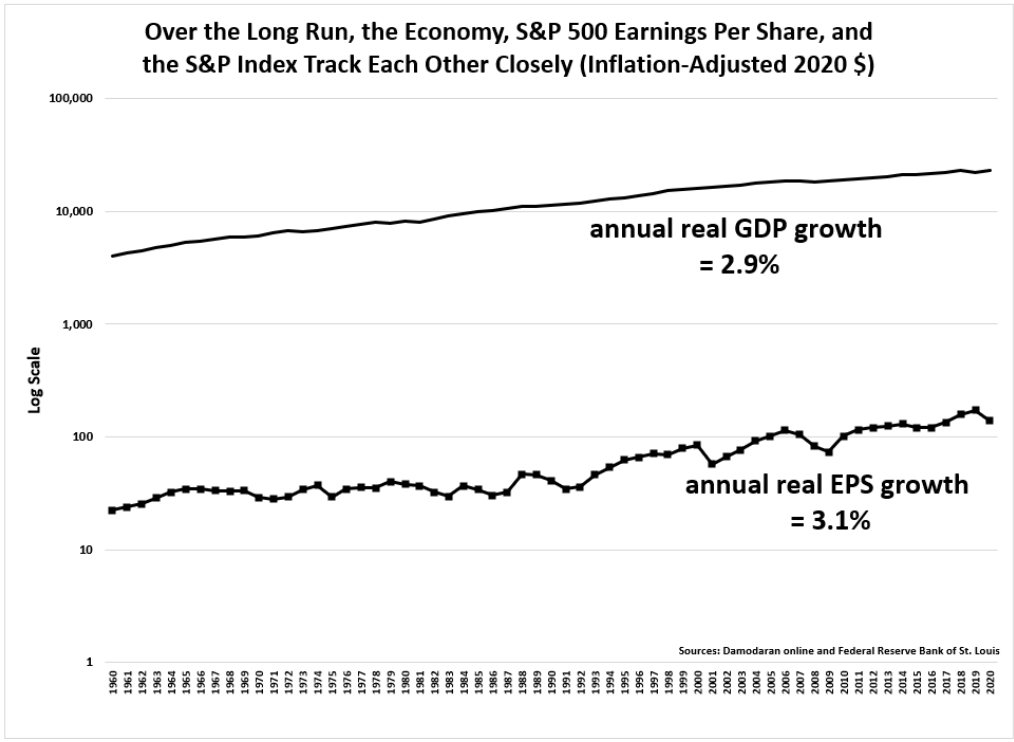
> The Commission rejected proposals to use a two-step DCF analysis for estimating the CAPM expected market return and found that the rationale for

> incorporating a long-term growth rate estimate in conducting a two-step DCF analysis of a specific utility or group of utilities for purposes of directly estimating the cost of equity does not apply to the DCF analysis of a broad representative market index with a wide variety of companies that is regularly updated to include new companies for purposes of determining the required return to the overall market. Further, the Commission found that because the dividend-paying members of the S&P 500 constitute a large portfolio of stocks, they include companies at all stages of growth.[11]

This can be demonstrated to be absolutely false. That the S&P 500 is a portfolio does not permit it to grow at a rate significantly different from the GDP growth rate. The net effect of this revolving portfolio does not produce a higher-than-GDP growth rate. See Figure 4 below, which appears in my direct testimony. (Direct-CUB-Kihm-55) There is not another set of data that we can examine. This is it.

[11] Federal Energy Regulatory Commission, March 17, 2022, Pacific Gas and Electric Company Docket No. ER16-2320-002, *Order on Further Briefing Concerning Return on Equity*, p. 78.

Figure 4



This is the sort of problem with regulatory ROE policies. Regulators often make findings that are clearly incorrect. And some commissioners are starting to say so.

Q. Which commissioners?

A. For example, consider the recent dissenting opinions of two FERC commissioners. First, Commissioner Richard Glick's May 21, 2020 Statement in Docket No. EL14-12-004:

> Today's order is yet another twist in the Commission's decade-long effort to adapt its methodology for setting public utilities' return on equity (ROE) to the low-interest rate conditions that have prevailed since the late 2000s. In that time, the Commission has proposed multiple different ways of dealing with the fact that its long-standing ROE methodology produces cost-of-equity estimates well below the ROEs it generally permitted public utilities to collect in the years before the Great Recession…
>
> I am particularly troubled that the Commission is portraying its change of heart as a dispassionate assessment of various technical questions—the comparative merits of one financial model, the right source of data for another, or the appropriate application of various assumptions. It is hard for

> me to believe that anyone buys that this latest twist is a genuine reassessment of those technical minutiae…
>
> Instead, it appears that the Commission again has chosen a path directed by the results, in this case the perceived need to award a higher ROE, rather than the law and the facts…
>
> The Commission must be transparent about the factors driving its decisionmaking process. If we think the ROEs set by the Commission's methodology are too low—or, for that matter, too high—we ought to say so and explain our reasoning, rather than pretending to be concerned only with the technical details of our models, data, and assumptions.

Then, Commissioner Danly's March 17, 2022 dissent in Docket No. ER16-2320-002:

> This common sense-defying outcome underscores a fundamental concern I have with the Commission's convoluted ROE precedent and policy: we have created a Rube Goldberg machine that ultimately can be manipulated into supporting any ROE a majority of Commissioners favors at a given moment.

Few finance experts actually believe that regulators are applying finance principles when setting ROEs. See Direct-CUB-Kihm-45.

Q. What are the implications for this proceeding?

A. CUB asserts that what all regulators are doing is consistent with our analysis in which the ROE is set well above the cost of equity. That regulators say something else takes us back to Chairman Glick: "If we think the ROEs set by the Commission's methodology are too low—or, for that matter, too high—we ought to say so and explain our reasoning." That is precisely what CUB suggests that the Wisconsin Commission do. Tell us the policy rationale for why customers should pay for an ROE that lies above the cost of equity.

Q. At Rebuttal-WPSC-Bulkley-36 she rejects your suggestion that utilities can raise capital at essentially any positive ROE. Do you have any comment on that?

A. Yes. The ability of firms to raise capital at very low ROEs is not a matter of dispute. It's all about pricing. In 2009 Alcoa was earning ROEs of about 2% to 3%; it raised about $1

billion of equity capital from new investors by slashing its stock price to $5 per share from a book value of $14 per share.[12] That would be akin to WEC Energy Group selling its stock at $12 per share today. Capital flowed to Alcoa because its price declined to a level that made it attractive to new investors.

Roger Morin, who represents utilities in regulatory proceedings makes the same case CUB does in this regard. Capital access is almost never a problem—it is the price to which the stock must fall to attract capital that is the matter of concern:

> The above example does not imply that utilities cannot, in fact, raise capital when share prices are below book value, but they can do so only at the expense of the existing shareholders. When expected earnings are less than investors' requirements and a sale of stock occurs, new shareholders can only expect to gain their return requirement at the expense of the old shareholders. The market recognizes the potential dilution impact and reprices the shares downward as protection of the required return. A regulatory policy of setting the allowed returns so as to obtain a market to book ratio of at least 1.0 avoids such deliberate economic confiscation and abides by the financial integrity criterion of the *Hope* case and the financial soundness criterion of the *Bluefield* case.[13]

CUB is proposing a return on equity of 9%, which if authorized would still leave the utility's stock price well above book value. As Morin says, there would be no confiscation of capital or integrity problems under that ROE.

Q. At Rebuttal-WPSC-Bulkley-44-45 she discusses what has happened at Arizona Public Service Corp since the Arizona Commission lowered its ROE to 8.7%. Is there more to the story?

A. As Morin states, there is no confiscation and no dilution if a utility issues stock at a price above book value. Its current stock price is $69.38. Its book value is $52.27.

Q. How will the 8.7% ROE affect the utility and its customers?

[12] *The New York Times*, March 20, 2009, Alcoa Raises $1.3 Billion.
[13] Roger Morin, 2006, *New Regulatory Finance*, Vienna, VA: Public Utilities Reports, p. 364.

A. Finance theory would suggest that the utility stock price will be lower, but the utility will still make the same investments as it would to create investor value, and it will still have the same ability to raise capital and to serve its customers. In other words, other than the lower stock price (which is already manifest), nothing will change. So says Pinnacle West Chairman and CEO Jeff Guldner:

> As we look ahead, the path for Pinnacle West and our primary subsidiary Arizona Public Service is filled with promise. While there may be challenges, these are outweighed by opportunities for growth, progress in the transition to clean energy and dedication to an improved customer experience. The rate case outcome we saw in 2021 was not what we wanted or expected – nor was it constructive. Nonetheless, the decision did not change who we are and what we do, and it did not change our promise as a company: our commitment to deliver value to our customers, our communities, and to you, our shareholders. It is your confidence and investment in us that make it possible to deliver the product and services that power Arizona's economy and way of life, something we do not take for granted.[14] (Emphasis added.)

Q. Are there other aspects of Ms. Bulkley's rebuttal testimony that you disagree with?

A. Yes. But I will not list all of them here. Nothing in her testimony changes any of the conclusions I have set forth in my direct or rebuttal testimony.

Q. Does this conclude your surrebuttal testimony?

A. Yes.

[14] Statement of Jeff Guldner, *Pinnacle West 2021 Annual Report*.